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Kernels, Duality and Optimal Transport

Henri De Plaen

Supervisor:
Prof. dr. ir. Johan A. K. Suykens

Dissertation presented in partial fulfillment of the requirements for the degree of Doctor of Engineering Science (PhD): Electrical Engineering

July 2024

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Examination committee:
Prof. dr. ir. The Chairman, chair
Prof. dr. ir. Johan A. K. Suykens, supervisor
Prof. dr. ir. Panagiotis Patrinos
Prof. dr. ir. Karl Meerbergen
Prof. dr. Tinne Tuytelaars
Prof. dr. M. Cuturi
(Apple, ENSAE Paris)

Dissertation presented in partial fulfillment of the requirements for the degree of Doctor of Engineering Science (PhD): Electrical Engineering

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Uitgegeven in eigen beheer, Henri De Plaen, Kasteelpark Arenberg 10 box 2446, B-3001 Leuven (Belgium)

Preface

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Abstract

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Chapter 1

Introduction

La mathématique est l'art de donner le même nom à des choses différentes.

— Henri Poincaré (1854–1912)

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Chapter 2

Manual

2.1 Tips and Tricks

2.1.1 Image on the cover page

If you want to place an image on the cover of the dissertation, you can add the code underneath to the template (check with your promotor whether this is allowed).

Include image: Search for the `\frontcoverheaderXII` command in the `adsphd.cls` file and add the following lines:

```
\begin{textblock*}{56mm}(10mm+#1,15mm)
\includegraphics[width=56mm,height=20mm]{image/filename}
\end{textblock*}
```

Where 56mm is the width, 20mm the height, 10mm the x-location and 15mm the y-location.

Change cover font color: Add the command `\color{red}` to the `\frontcoverheaderXII` command or enclose specific parts. For example, `{\color{red}\textbf{\@authorf\ \@authorl}`.

2.1.2 Full cover page

Important: most printing services will create their own cover page based on the details you send them (title, name, affiliation, ...) and do not supply you with all necessary parameters (e.g., thickness of the paper) because these differ from machine to machine. Therefore, the generated cover page is only indicative and probably not used by your printing server (or even correct).

A full cover page (combining front cover, spine and back cover) can be generated automatically using the command `make cover` or `python3 run.py cover`. This creates a pdf `$(COVERPDF)`; by default this is `cover.pdf`.

The width of the spine is set by redefining
`adsphdspinewidth` (9mm by default).

It can be seen in the provided `thesis.tex` that all information necessary to generate a cover page is contained between two markers

```
%%% COVER: Settings %%%
...
%%% COVER: End settings %%%
```

DO NOT REMOVE THESE!! They are used by the Makefile!!

The default front and/or back cover page can be overwritten:

- create a file `mycoverpage.tex`
- redefine the commands `\makefrontcovergeneral` and `\makebackcovergeneral`. For an example and more information, see the provided file `mycoverpage.tex`.

The cover page in the generated pdf has the following structure:

```
<--rbleed--><--backcoverpage--><--lbleed--><--spine width--><--lbleed--><--frontcoverpage--><--rbleed-->
```

The default bleed (both lbleed and rbleed) is 7mm. I suggest not changing this value unless you know what you are doing ;) The latter can be done by redefining `\defaultlbleed` and `\defaultrbleed` respectively.

2.1.3 Table of contents

To remove list of figures, tables and other preface chapters from the table of contents, search for occurrences of `\addcontentsline` in the file `adsphd.cls` and comment them.

2.1.4 Small ebook size

When you add the epub option to the adsphd class the dissertation is printed to a smaller size to read on a device such as Kindle.

Environments such as tables or tikZ pictures are often sized in absolute values and not relative to the size of the output. You can wrap them in a resizebox to enforce scaling:

```
\resizebox{\textwidth}{!}{%
  \begin{tabular}{cc}
    ...
  \end{tabular}
}
```

2.2 Settings for TeXstudio

If you are working with TeXstudio or other windows latex editors you might want to adjust the editor's settings to allow a proper compilation of the table of contents and list of figures/tables.

2.2.1 Custom *makeindex* and *makeglossaries* commands

According to the *README.md* the tables are indexed through two custom commands. To edit them in TeXstudio open the *Commands* settings (*Options* → *Configure TeXstudio...*, *Commands* sheet), edit the following fields and press OK.

Makeindex:

```
"C:/Program Files/MiKTeX 2.9/miktex/bin/x64/makeindex.exe" %.nlo -s nomencl.ist -o %.nls
```

Makeglossaries:

```
"C:/Program Files/MiKTeX 2.9/miktex/bin/x64/makeindex.exe" %.glo -s %.ist -t %.glg -o %.gls
```

Now the customized commands can be launched by using *Tools* → *Commands* → *MakeIndex/Makeglossaries*. If you want to automatize it in the standard *Build & View* (F5) and *Compile* (F6) commands look at the following section.

2.2.2 Custom Build&View and Compile meta-commands

Open *Options* → *Configure TeXstudio..., Build* sheet, edit the following field and press OK.

Build & View:

```
txs:///pdflatex | txs:///bibtex | txs:///makeglossaries | txs:///makeindex |
txs:///pdflatex  | txs:///pdflatex
```

To view the PDF once created you have to press F7 (or *Tool* → *View*) and the PDF will automatically update in the default viewer whan you modify it.

If you prefer to directly view the created PDF **from the beginning** edit the field as follow:

```
txs:///pdflatex | txs:///bibtex | txs:///makeglossaries | txs:///makeindex |
txs:///pdflatex  | txs:///pdflatex | txs:///view-pdf
```

Chapter 3

This is conclusion

...

Appendix A

This is myappendix

...

This is curriculum

...

List of publications

Input file chapters/publications/publications.tex does not exist. Make sure its starts with “\chapter{List of publications}”. To not include this chapter in the table of contents, use the starred version of the \chapter command...

FACULTY OF ENGINEERING SCIENCE
DEPARTMENT OF ELECTRICAL ENGINEERING
ESAT-STADIUS
Kasteelpark Arenberg 10 box 2446
B-3001 Leuven
henri.deplaen@esat.kuleuven.be